Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

required triangle. For, by construction, $\triangle ABC$ is similar to $\triangle AOB$, and, consequently, $\triangle ABC$, the vertices of which lie on the three circumferences, is similar to $\triangle OAD$.

Solved similarly by C. N. Schmall.

394. Proposed by W. J. GREENSTREET, M. A., Editor, The Mathematical Gazette, Stroud, England.

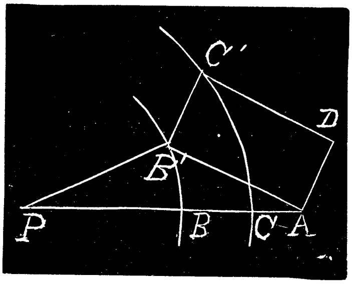
The joins of the excentres to the corresponding vertices of the pedal triangle are concurrent.

No solution of this problem has been received.

395. Proposed by V. M. SPUNAR, M. and E. E., Chicago, Ill.

From a point P without a rectangular field ABC the distances PA, PB, PC measured to the corners are respectively 70, 40, 60 chains. What is the area of the field?

Solution by A. H. HOLMES, Brunswick, Maine; J. SCHEFFER, A. M., Hagerstown, Maryland, and M. A. MUZZY, Waterville, Maine.



Let P be the point without the field. Draw the line PBA; on it lay off $PB=40$ chains, $PC=60$ chains, and $PA=70$ chains. Then any point on the circumference of circle whose center is P and radius PB may be one corner of the rectangular field. One such field is $AB'C'D$. Hence, the problem is indeterminate. To make the problem determinate, one of the angles APB', APC', or $B'PC'$ should be given.

396. Proposed by DANIEL KRETH, Oxford, Iowa.

In the triangle ABC, $AB=214$, $BC=263$, and $AC=405$. A point P is situated in the same horizontal plane; angle $BPA=13^\circ\ 30$ and angle $BPC=29^\circ\ 50'$. Find the distances, AP, BP, and CP.

Solution by M. A. MUZZY, Waterville, Maine.

Draw a circle through P, A, C, cutting BP in some point D. Then $BPA=ACD$, $BPC=CAD$, or $BPC=180^\circ-CAD$. Hence $CAD=29^\circ\ 50'$ or $150^\circ\ 10'$, $ADC=136^\circ\ 40'$ or $16^\circ\ 20$. There are four solutions.

In triangles CAD find $CD_1=CD_2=293.60$, $CD_3=CD_4=716.43$.

In triangle ABC find $ACB=28^\circ\ 23.8'$. $BCD=ACB\mp ACD$. Whence $BCD_1=BCD_4=14^\circ\ 53.8'$, $BCD_2=BCD_3=41^\circ\ 53.8'$.

In triangles BCD find $CBD_1=105^\circ\ 21.2'$, $CBD_2=77^\circ\ 13.4'$, $CBD_3=119^\circ\ 27.8'$, $CBD_4=156^\circ\ 46.0'$.

In triangles CBP find $BP_1=372.59$, $BP_2=389.09$, $BP_3=269.93$, $BP_4=422.58$; $CP_1=509.80$, $CP_2=515.58$, $CP_3=460.29$, $CP_4=208.55$.

In triangles APB find $AP_1=166.77$, $AP_2=572.10$, $AP_3=57.96$, $AP_4=600.81$.

Also solved by J. Scheffer and H. C. Feemster.

CALCULUS.

320. Proposed by J. F. LAWRENCE, Stillwater, Oklahoma.

Show that, if $u=1+A_1x+\frac{1}{2\,!}A_2x^2+\frac{1}{3\,!}A_3x^3+\dots$ where the quantities A are connected by the relation $A_m=mA_{m-1}-\frac{1}{2}(m-1)(m-2)A_{m-3}$, then $\log[u(1-x)^{\frac{1}{2}}]=\frac{1}{2}x+\frac{1}{4}x^2$. [From Forsyth's *Differential Equations*, p. 48.]

I. Solution by E. B. ESCOTT, Ann Arbor, Michigan.

$$u=1+A_1x+\frac{1}{2\,!}A_2x^2+\dots+\frac{A_m}{m\,!}x^m+\dots$$

where $A_m=mA_{m-1}-\frac{1}{2}(m-1)(m-2)A_{m-3}$.

Form the expression which has for the coefficient of x^m,

$$A_m-mA_{m-1}+\tfrac{1}{2}(m-1)(m-2)A_{m-3}$$

multiplied by some factor. Then such an expression will have only a finite number of terms. Such an expression is

$$u-xu+\tfrac{1}{2}\int x^2u\,dx;$$

also its derivative

$$(1-x)\frac{du}{dx}+(\tfrac{1}{2}x^2-1)u.$$

Therefore, we have for the differential equation of u,

$$(1-x)\frac{du}{dx}+(\tfrac{1}{2}x^2-1)u=0.$$

Separating variables,

$$\frac{du}{u}+\frac{\frac{1}{2}x^2-1}{1-x}dx=0.$$

whence

$$\log u(1-x)^{\frac{1}{2}}=\frac{x}{2}+\frac{x^2}{4},$$